



# Spectral Gamma-Ray Borehole Log Data Report

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Borehole

# 40-10-13

Log Event A

## Borehole Information

Farm : <u>S</u>	Tank : <u>S-110</u>	Site Number : <u>299-W23-218</u>
N-Coord : <u>35,959</u>	W-Coord : <u>75,642</u>	TOC Elevation : <u>665.00</u>
Water Level, ft : <u>124.00</u>	Date Drilled : <u>7/31/1978</u>	

## Casing Record

Type : <u>Steel-welded</u>	Thickness : <u>0.280</u>	ID, in. : <u>6</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>125</u>	

Cement Bottom, ft. : 130      Cement Top, ft. : 125

## Borehole Notes:

This borehole was drilled in July 1978 to a depth of 130 ft. The borehole was started with an 18-ft length of 8-in. surface casing and was completed to a nominal depth of 125 ft using 6-in. casing. The 5 ft of open borehole below the bottom of the 6-in. casing was filled with grout. The 18-ft length of surface casing was removed upon completion of the borehole, and the annulus between the 6-in. casing and the portion of the borehole wall drilled with the 8-in. casing was grouted. The casing thickness is presumed to be 0.280 in., on the basis of the published thickness for schedule-40, 6-in. steel tubing. The drilling record does not mention if the borehole casing was perforated. The top of the casing, which is the zero reference for the SGLS, is approximately flush with the tank farm grade.

## Equipment Information

Logging System : <u>1</u>	Detector Type : <u>HPGe</u>	Detector Efficiency: <u>35.0 %</u>
Calibration Date : <u>04/1996</u>	Calibration Reference : <u>GJPO-HAN-5</u>	Logging Procedure : <u>P-GJPO-1783</u>

## Log Run Information

Log Run Number : <u>1</u>	Log Run Date : <u>07/11/1996</u>	Logging Engineer: <u>Kim Benham</u>
Start Depth, ft.: <u>0.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>70.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Log Run Number : <u>2</u>	Log Run Date : <u>07/12/1996</u>	Logging Engineer: <u>Alan Pearson</u>
Start Depth, ft.: <u>124.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>69.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>



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### Analysis Information

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Analyst : E. Larsen

Data Processing Reference : P-GJPO-1787

Analysis Date : 04/10/1997

#### Analysis Notes :

This borehole was logged by the SGLS in two log runs. The pre- and post-survey field verification spectra met the acceptance criteria established for the peak shape and detector efficiency, confirming that the SGLS was operating within specifications. The energy calibration and peak-shape calibration from these spectra were used to establish the channel-to-energy parameters used in processing the spectra acquired during the logging operation.

Casing correction factors for a 0.280-in.-thick steel casing were applied during analysis.

The man-made radionuclide Cs-137 was detected in this borehole. Measurable Cs-137 contamination was detected continuously from the ground surface to a depth of 7.5 ft and from 122.5 ft to the bottom of the logged interval (124 ft).

Slightly decreased K-40 concentration values generally occur between the ground surface and 18 ft. The K-40 concentration values increase at about 48 ft. A region of variable K-40 concentration values occurs between 48 and 54 ft. The K-40 concentration values increase at about 54 ft and, except for a localized decrease at 98.5 ft, remain elevated to the bottom of the logged interval. The U-238 and Th-232 concentrations increase sharply near the bottom of the logged interval.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Report for tank S-110.

#### Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.